

**REMARKS**

No claims having been added or cancelled, the Applicant respectfully submits that a total of 10 claims, *i.e.*, claims 2, 4 and 8-15, are pending and properly under consideration in the present application. Of those, claim 8 is the only independent claim.

The Applicant notes with appreciation the Examiner's indication that the RCE was timely and properly filed and that the amendment of January 21, 2003, has been entered.

**Objections to the drawings**

The drawings stand objected to under 37 C.F.R. § 1.83(a) in light of certain bond pad configurations recited in claims 11 and 12. The Applicant respectfully submits that the additional FIG. 8 attached hereto illustrates the specific bond pad configurations recited in claims 11 and 12. The Applicant further submits that the Specification, as filed, indicated that the present invention was compatible with a range of chip configurations. Specification at 2 and 8. The Applicant further contends that the newly illustrated bond pad configuration are conventional and would have been understood by one in the art to have been encompassed by the original disclosure. The Applicant, therefore, respectfully contends that the new FIG. 8 and the clarifying amendments to the Specification indicated above do not constitute new matter and should be entered. The Applicant, therefore, requests that this objection be withdrawn.

Rejections under 35 U.S.C. § 103(a)

Claims 2 and 8-10 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Iwaya et al., U.S. Patent No. 6,392,295 (“Iwaya”) in view of Ohi et al., U.S. Patent No. 5,235,207 (“Ohi”). The Applicant respectfully traverses this rejection.

The Applicant respectfully submits that Iwaya’s many first leads 2a, an acknowledged total of 50 leads, Action at 4, are not the “as many as four stable leads,” *i.e.*, 1-4 stable leads, recited in claim 8. Even if four of the first leads were arbitrarily designated as the “stable” leads, the remaining 46 “first” leads still cross the periphery of the chip and cannot, therefore, be the “general” leads recited in claim 8. Indeed, the Applicant respectfully submits that the cited portions of Iwaya disclose a lead structure, *i.e.*, with *many* leads crossing the chip periphery and a *few* leads arranged outside the periphery, that is the inverse of the claimed structure in which a relatively few stable leads cross the periphery and many general leads are arranged outside the periphery. The Applicant, therefore, respectfully contends that Iwaya, as it would be understood by one of ordinary skill in the art, does not teach or suggest the claimed lead configuration.

The Applicant also respectfully notes that an important feature of the leads as taught by Iwaya is the bending portion, for example 2b<sub>1</sub> of FIG. 8, that is intended to prevent the sealing member from transformation by establishing a satisfactory resin balance between an upper portion and a lower portion of the sealing member, Abstract. As taught by Iwaya, these bending portions are provided on some of the leads to enhance the performance and reliability of the resulting semiconductor device. Col. 6, lines 1-21. The Applicant thus contends that one of ordinary skill in the art relying on Iwaya would be lead to a lead structure that is substantially different than the presently claimed structure.

The Applicant respectfully notes that Ohi, unlike Iwaya, is directed to those semiconductor chips in which the bonding pads are arranged around the periphery of the active surface in which:

A common inner lead 2A is laminated on the circuit-forming surface of the semiconductor chip 1 via an insulating adhesive material or an insulating tape 3. *The common inner lead 2A is constituted as a unitary structure by a semiconductor chip-fastening ring 2A<sub>1</sub> which firmly adheres to the semiconductor chip 1 via the insulating adhesive material or the insulating tape 3, and four hanger leads 2A<sub>2</sub> that support the corners of the semiconductor chip-fastening ring 2A<sub>1</sub> in a hanging manner.* The semiconductor chip-fastening ring 2A<sub>1</sub> has a square shape with its central portion being punched.

Col. 5, lines 1-11 (emphasis added). This structure is purported to provide reduced resistance to a common reference voltage such as V<sub>CC</sub> or V<sub>SS</sub>, with the bonding pads BP being arranged outside the periphery of common inner lead 2A to avoid the need for bonding wires from the signal inner leads 4A to cross common inner lead 2A to reduce the possibility of short circuits. Col 9, lines 11-17.

The Applicant respectfully contends that the fundamental differences in the approach to leadframe configuration and bond pad alignment addressed in Iwaya and Ohi are such that one of ordinary skill in the art would not attempt to combine the teachings of these two references in the manner suggested in the Action. With respect to this proposed combination, the Applicant respectfully submits that the proposed modification of Iwaya is inconsistent with the explicit teachings of the reference and would change the principle of operation of the prior art invention being modified. The Applicant respectfully contends that the degree of modification required for Iwaya to approach the claimed invention would required a significant departure from the very principles that one of ordinary skill would draw from Iwaya. The Applicant respectfully

contends, therefore, that the need to depart from the plain teachings of Iwaya renders the proposed combination insufficient to support the present rejection. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

The Applicant also respectfully contends that the Action fails to “present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references,” *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). The Applicant further submits that the Action does not adequately identify the alleged teaching(s) and/or suggestion(s) in the prior art that would lead one of ordinary skill to make the proposed combination with a reasonable expectation of success, *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) and contends that general references to process simplification and yield improvement are insufficient to support the proposed combination. In light of the absence from the Action of these required elements necessary to sustain a rejection under 35 U.S.C. § 103(a) and the substantial and unsupported modification of the principles of operation taught in the primary reference, the Applicant respectfully submits that this rejection must be withdrawn. M.P.E.P § 706.02(j).

Claims 11 and 12 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Iwaya in view of Ohi and in further view of Russell, U.S. Patent No. 5,545,920 (“Russell”). The Applicant respectfully traverses this rejection.

The Applicant respectfully incorporates the arguments presented above regarding the teachings and deficiencies of the proposed combination of Iwaya and Ohi and submits that Russell does not remedy those deficiencies. The Applicant respectfully submits that the wires

connecting the bond pads and the general leads in the exemplary embodiments of the invention will necessarily be longer and must cross the chip periphery to reach the centrally located bond pads when compared to wires from leads that extend well across the chip periphery. This claimed configuration of a LOC package, however, is directly contrary to Russell's teachings to reduce the length of the conducting wires. Russell, col. 2, lines 42-55; col. 4, lines 11-39 and FIGS. 3-5. Preferred embodiments of Russell's LOC package include the addition of enlarged common bond pads, FIG. 3, reference number 31, or supplemental rows of peripheral bond pads, FIG. 4, reference number 51. The Applicant respectfully contends, therefore, that the LOC construction taught by Russell is substantially different than that of the present invention and would not be sufficient, in combination with Iwaya and Ohi, to render the claimed invention obvious to one of ordinary skill in the art.

Claims 4 and 13-15 stand rejected 35 U.S.C. § 103(a) as unpatentable over Iwaya in view of Ohi and in further view of Takeuchi, U.S. Patent 5,977,614 ("Takeuchi"). The Applicant respectfully traverses this rejection.

The Applicant respectfully incorporates the arguments presented above regarding the teachings and deficiencies of the proposed combination of Iwaya and Ohi and submits that Takeuchi does not remedy those deficiencies. In particular, the Applicant submits that Takeuchi, see FIG. 6 and associated text, teaches lead structures similar to those in Iwaya in which all, or substantially all, of the general leads cross the chip periphery and extend significantly over the semiconductor chip, a structure contrary to the claimed construction of an LOC according to the invention. The Applicant also respectfully contends that Takeuchi is silent

as to which, if any, portions of the illustrated leads are in contact with the adhesive tape, and does not, therefore, distinguish any “attachment sections” on the inner leads that would permit a comparison with the remainder of the inner portions of the leads and thus does not teach or suggest the limitations as recited in claims 4, 13-15.

Indeed, the Applicant notes that Takeuchi, at col. 8, lines 15-28, makes clear that the “indented forms” are provided to reduce disconnection of the wires due to differences in the expansion coefficients of the *lead frame* and the *sealing resin*. Absent any suggestion regarding the attachment of the lead frame to the semiconductor chip, the Applicant respectfully contends that Takeuchi cannot fairly be said to teach or suggest a chip-lead adhesion promoting structure on those relatively few stable leads that cross the chip periphery.

### **CONCLUSION**

In view of the foregoing amendments and discussion, Applicants respectfully submit that the pending claims 2, 4, 8-15 are patentable over the cited references, and that the application as a whole is now in condition for allowance. Early and favorable notice to that effect is respectfully solicited.

In the event that any matters remain at issue in the application, the Examiner is invited to contact the undersigned at (703) 668-8034 for the purpose of a telephonic interview.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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By



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